

REMARKS

I. CLAIM STATUS

Claims 49-54 and 60-98 are pending and under examination. Claim 82 is amended herein to replaced "crosslinked elastomeric material" with "crosslinkable elastomeric material." Support for the amendment may be found throughout the as-filed specification and claims. No new matter has been added.

Applicants thank the Office for withdrawing the obviousness rejections articulated in the Office Action mailed August 14, 2008. In the pending Office Action dated March 20, 2009 (hereafter, "Office Action"), the Office rejects claims 49-54 and 60-98 on new grounds. See Office Action, pages 2-5. Applicants respond as follows.

II. RESPONSE TO CLAIM REJECTION

The Office rejects claims 49-54 and 60-98 under 35 U.S.C. § 103(a) as allegedly being unpatentable over a combination of Japanese Publication No. JP 03-169713 to Hara ("Hara") and U.S. Patent No. 6,598,645 to Larson ("Larson").¹ See Office Action, pages 2-5. In particular, the Office alleges that ". . . one of ordinary skill in the art at the time of the invention would have found it obvious to include . . . [Larson's] inorganic reinforcement in the rubber layer of Hara." *Id.* at 3. Applicants disagree, and traverse this rejection for at least the following reasons.

Several basic factual inquiries must be made in order to determine the obviousness or non-obviousness of claims of a patent application under 35 U.S.C.

¹ With the Office Action, the Office provided the original Japanese text and an English abstract of Hara. As no full translation of Hara was provided by the Office, Applicants believe that the Office is relying on the English abstract. Similarly, Applicants rely only on the English of Abstract of Hara in this Response.

§ 103. These factual inquiries, set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 17, 148 U.S.P.Q. 459, 467 (1966), require the Examiner to:

- (1) Determine the scope and content of the prior art;
- (2) Ascertain the differences between the prior art and the claims in issue;
- (3) Resolve the level of ordinary skill in the pertinent art; and
- (4) Evaluate evidence of secondary considerations.

The obviousness or nonobviousness of the claimed invention is then evaluated in view of the results of these inquiries. *Graham*, 383 U.S. at 17-18, 148 U.S.P.Q. at 467; see also *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1730, 82 U.S.P.Q.2d 1385, 1388 (2007).

Indeed, to establish a *prima facie* case of obviousness, the Examiner must:

make a determination whether the claimed invention “as a whole” would have been obvious at that time to that person. Knowledge of applicant’s disclosure must be put aside in reaching this determination, yet kept in mind in order to determine the “differences,” conduct the search and evaluate the “subject matter as a whole” of the invention.

M.P.E.P. § 2142. “The key to supporting any rejection under 35 U.S.C. § 103 is the clear articulation of the reason(s) why the claimed invention would have been obvious.”
Id.

In the instant case, the Office has not established a *prima facie* case of obviousness, at least because the cited references - Hara and Larson - do not teach or suggest each and every element of the pending claims. Moreover, one of ordinary skill in the art would see no reason to combine Hara and Larson in the manner asserted.

Rather, one of ordinary skill in the art, considering Hara and Larson as a *whole*, would have been lead away from the claimed invention.

A. Hara and Larson do not teach or suggest all claim elements

Contrary to the Office's position, Hara and Larson do not teach or suggest each and every element of the pending claims. In this regard, Applicants note that independent claim 49 recites, *inter alia*:

A tyre for a two-wheeled vehicles, comprising: a carcass structure; a belt structure; a tread band; and a pair of sidewalls. . . wherein the belt structure comprises one layer of a plurality of circumferential coils, axially arranged side by side, of at least one cord . . . wherein the tread band is superimposed circumferentially on the belt structure; wherein the side walls are applied laterally on opposite sides relative to the carcass structure; wherein said layer of a plurality of circumferential coils is associated with at least one layer of a crosslinked elastomeric material, such that said at least one layer of a crosslinked elastomeric material is disposed either between said carcass structure and said layer of a plurality of circumferential coils or between said layer of a plurality of circumferential coils and said tread band; wherein said at least one layer of a crosslinked elastomeric material does not contain any cord; and wherein the elastomeric material comprises: at least one diene elastomeric polymer; and at least one layered inorganic material comprising an individual layer thickness from 0.01 nm to 30 nm.

Claim 49 (emphasis added). Independent claim 82 is drawn to a patentably distinct process and recites, *inter alia*:

A process for producing a tyre . . . associating at least one layer of a crosslinkable elastomeric material with said layer of a plurality of circumferential coils, such that said at least one layer of a crosslinkable elastomeric material is disposed either between said at least one carcass ply and said layer of a plurality of circumferential coils or between said layer of a plurality of circumferential coils and said tread; wherein said at least one layer of a

crosslinkable elastomeric material does not contain any cord; . . . subjecting the tyre to crosslinking by heating; . . . and wherein the elastomeric material comprises: at least one diene elastomeric polymer; and at least one layered inorganic material comprising an individual layer thickness from 0.01 nm to 30 nm.

Claim 82 (emphasis added). As will be described in detail below, Hara and Larson do not teach or suggest a tyre (or process to produce a tyre) comprising at least one layer of a crosslinked elastomeric material that is in the claimed position, which has the claimed composition, and which does not contain any cord.

From Hara's English abstract and figure 1, it appears that Hara discloses a tyre 1 provided with tread band 2, side wall 3, bead part 5, carcass 6, belt 7, cushion rubber layer 8, and band 9. Belt 7 is disposed radially outward from carcass 6, cushion rubber layer 8 is disposed radially outward of belt 7, band 9 is disposed radially outward of cushion rubber layer 8, and tread band 2 is disposed radially outward of band 9. See Hara, abstract and figure 1.

Thus, the only layers in Hara which are ". . . disposed either between said carcass structure and said layer of a plurality of circumferential coils or between said layer of a plurality of circumferential coils and said tread band . . ." are belt 7, soft cushion rubber layer 8, and band 9. See claims 49 and 82; Hara, abstract. However, Hara's band 9 and belt 7 contain cords, and are therefore excluded by the language of claims 49 and 82. See claim 49 ("wherein said at least one layer of crosslinked elastomeric material does not contain any cord . . ."); claim 82 (reciting essentially the same). Accordingly, only soft cushion rubber layer 8 can be considered as being in the position of the claimed "at least one layer of a crosslinked elastomeric material".

With this in mind, it is clear from the text of the Office Action that the Office equates soft cushion layer 8 of Hara with the claimed "at least one layer of a crosslinked elastomeric material." See Office Action, page 2 ("Hara teaches . . . a cushion layer or layer of crosslinked elastomeric material 8 . . ."). Applicants disagree with the Office's position for at least three reasons. First, the English abstract of Hara does not disclose or suggest that soft cushion layer 9 is a crosslinked elastomeric material, as claimed. Second, the English abstract of Hara provides no information suggesting that soft rubber cushion layer 8 comprises "at least one diene elastomeric polymer," as claimed. Third, and as admitted by the Office at page 2 of the Office Action, nothing in the English abstract of Hara teaches or suggests that soft cushion rubber layer 8 includes "at least one layered inorganic material . . . , " as claimed.

Larson does not cure the deficiencies of Hara. As explained in Applicants' prior responses, Larson discloses a belt ply, which is "comprised of a rubber composition and a plurality of spaced apart cords disposed in a substantially parallel relationship to each other, wherein said rubber composition encapsulates said cords." Larson, column 3, lines 46-50 (emphasis added). In contrast, while the claimed at least one layer of crosslinked elastomeric material is adjacent to (and thus, associated with) a layer of circumferential coils, the at least one layer does not contain any cord. In other words, the claimed **at least one layer** of crosslinked elastomeric material is separate and distinct from the **layer** of a plurality of circumferential coils, axially arranged side by side, of at least one cord wound at substantially null angel with respect to the equatorial plane of a tyre. Therefore Larson, like Hara, *does not* teach or suggest a tyre comprising at

least one layer of a crosslinked elastomeric material that is in the claimed position, which has the claimed composition, and **which does not contain any cord**.

B. One of ordinary skill would see no reason to combine Hara and Larson in an attempt to arrive at the claimed invention

Moreover, Hara and Larson provide no information that would motivate one of ordinary skill in the art to combine their divergent disclosures in an attempt to arrive at the claimed invention. Rather, one ordinary skill considering Hara and Larson as a whole would have been *lead away* from the claimed invention.

In this regard, Applicants again note that Hara discloses a tire comprising a soft cushion (emphasis added) rubber layer 8 disposed between carcass 6 and tread 2. Hara, abstract. The use of such a soft cushion rubber layer allows Hara to obtain a tire with improved high speed running stability, high speed durability, and wear resistance. *Id.*; see also, http://en.wikipedia.org/wiki/Tire_manufacturing (cushion layers "isolate the tread from mechanical wear from the steel belts"); http://www.tiretip.com/tire_construction.htm (cushion layers "separate tread from mechanical wear"). Applicants submit that one of ordinary skill would clearly understand that the "soft" rubber cushion layer of Hara cannot be a "stiff" layer. Indeed on its face, Hara's specification of a "soft" rubber "cushion" layer is antithetical to the provision of a "stiff" rubber layer.

With this in mind, Larson discloses a tire comprising a rubber cord laminate, sidewall insert, and/or apex that includes oriented clay particles that are partially or wholly exfoliated as a reinforcement. See Larson, column 1, lines 10-13, column 4, lines 4-40. As explained by Larson, the addition of such particles increases the

stiffness of Larson's rubber compositions. See *id.* at column 10, table 2, values of G' (demonstrating that the addition exfoliated clay to a rubber resulted in an 45-60% increase in stiffness).²

Other portions of Larson confirm the use of intercalated clay to increase stiffness of a rubber composition. For example, at column 4, lines 4-7, Larson explains that the rubber composition containing intercalated clay is used for the "said rubber/cord laminate, sidewall insert and said apex . . ." all of which are well understood in the art as being *stiff* components of a tire.

Further, at column 3, lines 56-62, Larson explains that the apex is "a strip of a rubber composition in a shape of an annular ring positioned within a carcass sidewall adjacent to a bead portion of the carcass in a primary annular direction circumferentially co-extensive within the sidewall portion of the carcass and a secondary radial direction extending toward and spaced apart from the tire tread." From this description, one of ordinary skill would understand Larson's apex as corresponding to the "bead filler" in the bead portion of a tire, i.e., the region that couples the tire to the rim of a wheel, and which is responsible for the transmission of torque from the tire to the rim, and vice versa. As a result, one of ordinary skill would readily understand that Larson's apex/bead filler must be stiff, else it could not adequately transmit forces from the tire to the rim and vice versa.

² As explained at column 10, lines 30-32, the " G' value . . ." is well known to those having skill in- such art . . . to be a measure of stiffness, wherein an increase of G' is a corresponding indication of an increase in stiffness of the rubber composition."

Moreover, Larson explains in column 3, line 63 to column 4, line 3, that the sidewall insert is a "strip of a rubber composition in a shape of an annular ring positioned within a carcass sidewall and spaced apart from a carcass bead portion in a primary annular direction circumferentially co-extensive within the sidewall portion of the carcass and a secondary radial direction extending toward and spaced apart from the tire tread." It is well understood in the art that such an element is used in so-called "run flat tires", i.e. tires being able to run also at substantially zero pressure for at least a limited distance without collapsing under the load of a vehicle, as a reinforcement of the sidewall to sustain the vehicle in case of a puncture. Accordingly, one of ordinary skill would understand that a sidewall insert must be stiff, else it could not sustain the load of a vehicle at substantially zero pressure.

For at least the foregoing reasons, Applicants submit that one of ordinary skill would see no reason to add Larson's oriented clay particle **reinforcement** to Hara's "**soft** rubber **cushion** layer." Rather, one of ordinary skill would have been *lead away* from such a combination, at least because Larson's oriented particles serve to **increase** the stiffness of a rubber composition, and thus would serve to degrade the **soft cushion** (i.e., non-stiff, isolation) properties of Hara's soft cushion rubber layer.

Further, in view of the respective disclosures of Hara and Larson, Applicants submit that one of ordinary skill in the art would expect that modifying Hara's soft rubber cushion layer to include Larson's oriented clay particle reinforcement, as alleged by the Office, would render Hara's invention unsatisfactory for its intended purpose. That is, modifying Hara's **soft** cushion rubber layer to include Larson's oriented particle reinforcement would be expected to **increase the stiffness** of Hara's soft rubber

cushion layer, thereby making it less effective as a soft cushion layer. It would also be expected to detract from the stated benefits of Hara's soft layer, i.e., the improvement of high speed straight running stability, high speed durability, and wear resistance of a tire, which are achieved by Hara through the use of a **soft cushion** rubber layer. See Hara, abstract. It has long been held that modifications which render the prior art being modified unsatisfactory for its intended purpose are not a proper route to establishing a prima facie case of obviousness. See M.P.E.P. § 2143.01(V) (citing *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984) and stating "if [a] proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification.").

For at least the foregoing reasons, Applicants submit that Hara and Larson, whether considered alone or in combination, do not teach or suggest each and every element of the pending claims. Moreover, one of ordinary skill would see no reason to modify Hara's soft rubber composition to include the intercalated clay reinforcement of Larson, as alleged by the Office. To the contrary, one of ordinary skill would have been lead away from combining Hara and Larson in an attempt to arrive at the claimed invention, at least because such a modification would be expected to render Hara's invention unsuitable for its stated purpose.

Applicants therefore submit that the 35 U.S.C. § 103(a) rejection of claims 49-54 and 60-98 in view of Hara and Larson is not tenable, and should be withdrawn.

III. CONCLUSION

In view of the foregoing amendments and remarks, Applicants respectfully request reconsideration of this application and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to our Deposit Account No. 06-0916.

Respectfully submitted,

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Attachments: http://en.wikipedia.org/wiki/Tire_manufacturing
http://www.tiretip.com/tire_construction.htm